I. IDENTIFICATION DATA

Thesis name:	**Equivalent Circuit of the Three Phase Induction Motor**
Author's name:	**Tatghir Rishabh**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automotive, Combustion Engine and Railway Engineering
Thesis reviewer:	Ing. Tomáš Haubert, Ph.D.
Reviewer's department:	Porsche Engineering Services, s.r.o.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**ordinarily challenging**

Evaluation of thesis difficulty of assignment.

The evaluation of the master thesis is ordinarily challenging. The state of the art in the induction machines modelling is know for many years. Only verification part of the thesis is challenging, because comparing of the simulation and real measurement results is difficult.

Satisfaction of assignment	**fulfilled with major objections**

Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.

The student fulfilled the first two points of the thesis. From my point of view, the student does not understand what is equivalent circuit, but if you use google and write "equivalent circuit of the squirrel cage induction motor" and click on the show images, you get a schematic of equivalent circuit. The point number 3 is not fulfilled in the thesis. The thesis assignment is about equivalent circuit and its parameters, but the thesis deals with the modelling of DTC for induction machines. Also direct comparing DTC simulation results with real motor which uses VECTOR control method is not correct. The DTC method is commonly used only in ABB company (see source nr. 10).

Method of conception	**correct**

Assess that student has chosen correct approach or solution methods.

The approach of the student is basically correct, but the assignment deals about something a little bit different than what is written in the thesis.

Technical level	**D - satisfactory**

Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.

The student is using in a few cases web pages like Wikipedia. The using of scientific sources like IEEE library is very limited here.

Formal and language level, scope of thesis	**D - satisfactory**

Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.

The thesis is written in Microsoft Word. Some equations are only screenshots (see pages 19, 20, 21, etc.). Also a quality of some pictures is not good (see page 30).

Selection of sources, citation correctness	**D - satisfactory**

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The sources used in this thesis are mostly online sources, where should be necessary to discuss about relevance of these sources.

Additional commentary and evaluation
Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.
If I compare assignment of the thesis and what is really there – it is a little bit different. The student made a model of induction machine with DTC control. But why he used this type of control? The commonly used method is vector control. The student wanted to make a verification of the results and in the chapter 5.4 is written "Generally, it is impossible to get everything perfectly in the simulation", but there is missing a discussion why it is impossible how how to solve this. The main problem which I see in this thesis is the verification part. The student made some measurements on the real motor and has some results from simulation. The result from the real measurement are some graphs made by Excel. The result from simulation are screenshots from Scope block in Simulink. Why the results were not imported to the MATLAB workspace and made one graph with DIRECT comparison between simulation and real measurement?

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

I have these question to the student:
- Could you explain a difference between DTC and vector control and present your reason for using of DTC?
- Present a schematic and parameters of an equivalent circuit of the IM?
- Could you present why the efficiency in the picture 2.7 is more than 100%?
- Could you make a static simulation in your model for 2900 rpm and 90 Nm and compare DC current and phase currents?

I evaluate handed thesis with classification grade **E – sufficient**.

Date: **5.9.2018**   Signature: